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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,289

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Takeshi Nakamura

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06/09/2009

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EXAMINER

THOMPSON, CAMIE S

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

06/09/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,289	Applicant(s) NAKAMURA, TAKESHI	
	Examiner Camie S. Thompson	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE filed 3/30/09.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 30, 2009 has been entered.
2. Applicant's amendment and accompanying remarks filed March 30, 2009 are acknowledged.
3. Examiner acknowledges amended claim 12.
4. The rejection of claims 1-5, 12 and 17-24 under 35 U.S.C. 102(b) as being anticipated by JP 2000-272040 is withdrawn due to applicant's argument.
5. The rejection of claims 1-8, 10-13 and 16-24 under 35 U.S.C. 103(a) as being unpatentable over JP 10-194856 in view of JP 2000-272040 is withdrawn due to applicant's argument.
6. The rejection of claim 9 under 35 U.S.C. 103(a) as being unpatentable over JP 10-194856 in view of JP 2000-272040 in further view of Grueber et al., U.S. Patent Number 6,838,162 is withdrawn due to applicant's argument.
7. The rejection of claims 14-15 under 35 U.S.C. 103(a) as being anticipated by JP 10-194856 in view of JP 2000-272040 and in further view of Yamaguchi et al., U.S. Patent Number 6,723,382 is withdrawn due to applicant's argument.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-12 and 15-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kameda et al., U.S. Patent Number 5,939,216.

Kameda discloses a fiber reinforced ceramic matrix composite that exhibits increased initial matrix cracking strength, crack propagation resistance and fracture energy and improved interlaminar strength (see column 2, lines 43-52). The reference discloses that the composite comprises a matrix sintered body formed of a silicon carbide ceramics derived by reaction sintering as per instant claims 7 and 16 (see column 3, lines 16-26). Kameda discloses that the composite comprises a ceramic matrix and a fiber preform wherein the fiber preform comprises a plurality of fabric elements comprising organic fibers used as auxiliary fibers and at least one ceramic fiber selected from silicon carbide fibers, alumina fibers, silicon nitride fibers and carbon fibers as per instant claims 3-6 and 21-24 (see column 4, lines 16-33 and column 7, lines 17-26). It is disclosed in column 7, lines 1-9 that the ceramic fibers can be doubled together or blended together as per instant claim 1. It is also disclosed in column 7 that the auxiliary fibers adherent to the ceramic fibers are converted to SiC matrix so that the matrix can be sufficiently formed also around the ceramic fibers as per the present claims. The reference discloses that the fibers bundled together are present in volume fraction of 10 to 40% by volume in the ceramic matrix as per instant claims 17-19. Column 4, lines 1-10 discloses that the ceramic matrix can be

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formed from a combination of silicone carbide, silicon nitride, alumina and zirconia as per instant claim 8. The reference discloses that there can be more than one ceramic fiber used in the fabric. It is disclosed in column 2, lines 43-65 that the fiber fabric is assembled at a predetermined volume fraction of fiber in the ceramic matrix. It is disclosed in column 8, lines 45-53 that the starting matrix is a slurry as per instant claim 15. The examples in the Kameda reference discloses that the fibers are exposed to high temperatures as per instant claim 12. Example 4 discloses a plate-like specimen cut out of the composite with the resulting composite being highly dense.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kameda et al., U.S. Patent Number 5,939,216 in view of JP 10-194856.

Kameda discloses a fiber reinforced ceramic matrix composite that exhibits increased initial matrix cracking strength, crack propagation resistance and fracture energy and improved interlaminar strength (see column 2, lines 43-52). The reference discloses that the composite comprises a matrix sintered body formed of a silicon carbide ceramics derived by reaction sintering as per instant claims 7 and 16 (see column 3, lines 16-26). Kameda discloses that the

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composite comprises a ceramic matrix and a fiber preform wherein the fiber preform comprises a plurality of fabric elements comprising organic fibers used as auxiliary fibers and at least one ceramic fiber selected from silicon carbide fibers, alumina fibers, silicon nitride fibers and carbon fibers as per instant claims 3-6 and 21-24 (see column 4, lines 16-33 and column 7, lines 17-26). It is disclosed in column 7, lines 1-9 that the ceramic fibers can be doubled together or blended together as per instant claim 1. It is also disclosed in column 7 that the auxiliary fibers adherent to the ceramic fibers are converted to SiC matrix so that the matrix can be sufficiently formed also around the ceramic fibers as per the present claims. The reference discloses that the fibers bundled together are present in volume fraction of 10 to 40% by volume in the ceramic matrix as per instant claims 17-19. Column 4, lines 1-10 discloses that the ceramic matrix can be formed from a combination of silicone carbide, silicon nitride, alumina and zirconia as per instant claim 8. The reference discloses that there can be more than one ceramic fiber used in the fabric. It is disclosed in column 2, lines 43-65 that the fiber fabric is assembled at a predetermined volume fraction of fiber in the ceramic matrix. The examples in the Kameda reference discloses that the fibers are exposed to high temperatures as per instant claim 12. Example 4 discloses a plate-like specimen cut out of the composite with the resulting composite being highly dense. Kameda does not disclose that the matrix is formed by CVI methods. The Japanese reference discloses a ceramic composite comprising a combination of higher elasticity fibers, SiC, with fibers having low elasticity, SiCO, in a ceramic matrix (see abstract). Reference claim 2 of the Japanese reference discloses that the ceramic matrix is produced by CVI methods as per instant claims 13. The Japanese reference discloses that the composite has increased crack propagation resistance. Therefore, it would have been obvious to one of ordinary skill in the art

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that the ceramic matrix of the Kameda reference could be formed by CVI methods since the Japanese reference uses CVI methods on the same ceramic matrix in order to achieve increased crack propagation resistance.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kameda et al., U.S. Patent Number 5,939,216 in view of Yamaguchi et al., U.S. Patent Number 6,723,382. Kameda discloses a fiber reinforced ceramic matrix composite that exhibits increased initial matrix cracking strength, crack propagation resistance and fracture energy and improved interlaminar strength (see column 2, lines 43-52). The reference discloses that the composite comprises a matrix sintered body formed of a silicon carbide ceramics derived by reaction sintering as per instant claims 7 and 16 (see column 3, lines 16-26). Kameda discloses that the composite comprises a ceramic matrix and a fiber preform wherein the fiber preform comprises a plurality of fabric elements comprising organic fibers used as auxiliary fibers and at least one ceramic fiber selected from silicon carbide fibers, alumina fibers, silicon nitride fibers and carbon fibers as per instant claims 3-6 and 21-24 (see column 4, lines 16-33 and column 7, lines 17-26). It is disclosed in column 7, lines 1-9 that the ceramic fibers can be doubled together or blended together as per instant claim 1. It is also disclosed in column 7 that the auxiliary fibers adherent to the ceramic fibers are converted to SiC matrix so that the matrix can be sufficiently formed also around the ceramic fibers as per the present claims. The reference discloses that the fibers bundled together are present in volume fraction of 10 to 40% by volume in the ceramic matrix as per instant claims 17-19. Column 4, lines 1-10 discloses that the ceramic matrix can be formed from a combination of silicone carbide, silicon nitride, alumina and zirconia as per

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instant claim 8. The reference discloses that there can be more than one ceramic fiber used in the fabric. It is disclosed in column 2, lines 43-65 that the fiber fabric is assembled at a predetermined volume fraction of fiber in the ceramic matrix. The examples in the Kameda reference discloses that the fibers are exposed to high temperatures as per instant claim 12. Example 4 discloses a plate-like specimen cut out of the composite with the resulting composite being highly dense. Kameda does not disclose that the ceramic matrix is produced by the PIP method. Yamaguchi discloses a ceramic composite wherein the ceramic matrix is SiC with SiC fiber dispersed therein. Yamaguchi discloses a PIP treatment (see Yamaguchi reference claims). The PIP treatment affects fiber impregnation. Therefore, it would have been obvious to one of ordinary skill in the art to have the ceramic matrix, SiC, of the Kameda reference formed by a PIP method in order to increase the efficiency of fiber impregnation.

Response to Arguments

13. Applicant's arguments with respect to the present claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Camie S. Thompson whose telephone number is 571-272-1530. The examiner can normally be reached on Monday-Friday 8:00 am - 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

Camie S Thompson
Examiner
Art Unit 1794